

## METHOD AND APPARATUS FOR A REARRANGEABLY NON-BLOCKING SWITCHING MATRIX

Saleh, Ali Najib; Duschatko, Douglas E.; and Quibodeaux, Lane Byron

### ABSTRACT OF THE DISCLOSURE

5 A switching apparatus is disclosed that employs a relatively simple and inexpensive switching matrix, but which avoids interruption of existing connections when connections are added or removed. The switching matrix switches errorlessly by controlling the point in time at which switching occurs. Using such a technique, switching can be performed without disturbing the connections already configured in  
10 the switching matrix, and so is referred to herein as being non-blocking. Optionally, the incoming data can be rearranged to provide a larger window of time in which the switching matrix can be switched. In the case of a switch using an optical backplane, this also allows more time for various components of the system (e.g., clock/data recovery units) to re-acquire lock. The switching apparatus includes a switching  
15 matrix and control circuitry. The switching matrix has a matrix input, a control input and a number of matrix outputs, and is configured to receive an information stream at the matrix input. The information stream includes a number of portions, while the control circuitry has a control output coupled to the control input. The control circuitry is configured to initially configure the switching matrix to output the  
20 information stream at a one of the matrix outputs and to subsequently configure the switching matrix to output the information stream at another of the matrix outputs during a period of time during which the one of the portions is transiting the switching matrix.